Amendments to the Specification:

Please replace the paragraph beginning on page 7, line 2 with the following amended paragraph.

The present invention can be used to manufacture components for a wide range of applications, including miniaturized electromechanical devices and optical components. For example, it overcomes the main technical problems in fabricating high-resolution and high-focusing-efficiency zone ~~pates~~ plates and other optics for x-ray applications, namely, fabricating high aspect ratio nanostructures with precise zone plate pattern. This is achieved by using the process of the nanomachining via particle-track-guided-etching of precise patterns. Therefore, the invention disclosed here can be applied to produce zone plates with both high spatial resolution and focusing efficiency. For example, the invention can be used to fabricate zone plates with zone width as small as 5 nm with an aspect ratio up to one thousand and with a diameter several millimeters. Such zone plates can be used for many imaging and focusing applications for x-ray energies up to 70 keV with high spatial resolution and high focusing efficiency. Other x-ray optical components such as gratings and resolution test standards can also be made using the process of the nanomachining via particle-track-guided-etching of precise patterns. The invention can also be used as a machining method for removing gross areas of materials. Additionally, the invention can be used for machining three-dimensional products.

Please replace the paragraph beginning on page 8, line 18 with the following amended paragraphs (original single paragraph split into these two paragraphs):

Step 1. Referring first to FIG. 1A, the method begins by irradiating wafer 10, which may comprise an insulator or semiconductor, with an energetic charged particle

beam 12 of predetermined collimation and direction with respect to the surface of the wafer. The passage of the particles through the material generates a strong electromagnetic field that breaks chemical bonds within its immediate vicinity along the particle tracks 14. The particle beam can be generated in a conventional manner, such as by removing some or all electrons from neutral atoms by an accelerator, or can be in the form of alpha particles emitted from a radioactive source. Most insulators or semiconductors as suitable materials for forming particle tracks can be ~~founded~~ found in P. B. Price and R. M. Walker, "Chemical Etching of Charged-Particle Tracks in Solids", Journal of Applied Physics, Vol. 33, No. 12, pp. 3407-3412, Dec. 1962, incorporated herein by reference.

Etchable tracks can be formed in bulk inorganic crystals and certain glasses and high polymers. Generally speaking, the materials must be insulators or weak semiconductors with ~~resisitivity~~ resistivity above approximately 10^4 ~~ohm.cm~~ ohm/cm. Therefore, metals or silicon or germanium would not typically be suitable materials for particle track etching. The range of useful ~~resisitivity~~ resistivity is wider for thin films, although thin films may not be suitable for most products. Preferred materials, having well-controlled shapes and engineerable characteristics, include quartz crystals, silica glasses, and mica.